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Abstract

At least 43 percent of the 127 million acres of U.S. land with high or medium potential for cropland is held by landowners whose characteristics may inhibit cropland development. Owners of potential cropland tend to have smaller holdings, lower net farm incomes, and less active involvement in agriculture than current cropland owners. About 20 percent of the potential cropland lies in small or fragmented holdings or faces competition from urbanization or nonagricultural uses. Another 23 percent is owned by those with short planning horizons and capital problems.

Key words: Landownership, cropland development, potential cropland

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Summary

More than 43 percent of the 127 million acres classified by USDA as potential cropland may be associated with landownership factors which could inhibit development for cropland. On the average, owners of potential cropland, compared to cropland owners, own smaller parcels of land, have lower net farm incomes, and are less active in farming as an occupation.

Just over 20 percent of the potential cropland is held in small or fragmented holdings and has competition from other uses such as urbanization or hobby farming. Another 23 percent is owned by low-income farmers with limited ability to pay cropland development costs or older owners unlikely to embark upon longrun cropland development projects. Some of this land also lies within highly urban areas where the future for farming is in doubt.

Most potential cropland in the Northeast and Pacific regions has landownership characteristics restricting cropland development while the Corn Belt, Northern Plains, and the Mountain regions have the least amount of potential crop acreage limited by landownership factors.

Potential Cropland: The Ownership Factor

Linda K. Lee*

Introduction

The amount of cropland in the United States fluctuates over time in response to economic conditions, agricultural commodity programs, urban growth, and other factors. Current projections of expected growth in domestic and export demands for U.S. agricultural products will require the development of additional cropland.¹ Most research on the Nation's ability to respond to these demands and convert noncropland to cropland has focused on the physical dimensions of the problem—the location, extent, and quality of additional cropland—as well as the economic relationships necessary to bring that land into production². Little attention has been given to those individuals who make decisions about potential cropland: the landowners.

Economists have hypothesized that certain landowners may be less responsive to price-cost relationships than others. Those with small or fragmented holdings, a commitment to a noncropland use, or lack of capital may decide not to develop their potential cropland even under relatively favorable economic conditions. Current estimates of potential cropland acreage, based primarily on physical and economic criteria, identify as much as 127 million acres of land with high or medium potential for cropland. If hypothesized relationships about landownership factors and cropland development are correct, then special characteristics of the landowners themselves may significantly reduce this estimate of

land with cropping potential. There may be other circumstances, of course, in which landowners undertake cropland development on land that soils technicians would rate as having low potential for crop use. The survey techniques used for this report do not permit estimation of the extent to which this may occur.

This report assesses the impact of landownership factors on the development of new cropland. Landownership patterns on potential cropland are presented and potential ownership obstacles to cropland development are discussed and evaluated.

Description of Data

Data for this analysis were obtained from a merger of the 1977 National Resource Inventories (NRI) conducted by the Soil Conservation Service (SCS) and the 1978 Landownership Survey of the Economics, Statistics, and Cooperatives Service (now the Economic Research Service), U.S. Department of Agriculture.³ The NRI was a two-stage, area-point sample of U.S. land.⁴ Approximately 70,000 primary sampling units of generally 160 acres in size were selected. Within each sampling unit, land use information on three selected points was collected by SCS field staff.

To provide a framework for the ESCS Landownership Survey, SCS obtained for ESCS the name and address of the owner of the first point in each sample unit. Of the 70,000 points, names and addresses for private landowners were available for 52,000 points, and slightly more than 37,000 completed landownership questionnaires were returned after followup procedures. The ESCS Landownership Survey obtained information from the landowners about personal characteristics such as age, income, and education as well as general information on size, organizational structure, and tenure status. This landownership information was merged with the NRI land use data collected by SCS and used in this analysis.

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¹For a summary of recent estimates, see Robert F. Boxley, "Competing Demands for U.S. Agricultural Land in the Year 2000," Technical Paper IV, National Agricultural Lands Study, 1980. A broader overview of the factors affecting demand for U.S. farmland is provided by *The Future of American Agriculture as a Strategic Resource*, Sandra S. Batie and Robert G. Healy, eds. (Washington, D.C.: The Conservation Foundation, 1980) and Pierre Crosson, "Agricultural Land Use: A Technological and Energy Perspective" in *Farmland, Food and the Future*, Max Schnepf, ed. (Ankeny, Iowa: Soil Conserv. Soc. of Amer., 1979) pp. 99-122.

²An example of research undertaken on the physical dimensions of the problem is Raymond L. Dideriksen, Allen R. Hidlebaugh, and Keith O. Schmude, *Potential Cropland Study* (Soil Conser. Serv., U.S. Dept. Agr., SB-578, 1977). For research on the economics of cropland conversion see Orley M. Amos, "Supply of Potential Cropland in Iowa," unpublished Ph.D. thesis, Iowa State Univ., 1979, and Robert N. Shulstad and Ralph D. May, "Conversion of Non-cropland to Cropland: The Prospects, Alternatives, and Implications," *Amer. J. Agr. Econ.*, LXII (Dec. 1980) pp. 1077-1083.

³James A. Lewis, *Landownership in the United States, 1978* (Econ. Stat. Coop. Serv., U.S. Dept. Agr., AIB-435, 1980).

⁴The NRI used a one-third subsample of the 1958 Conservation Needs Inventory. For more detailed information on the original sample see Conservation Needs Inventory Committee, *Basic Statistics of the National Inventory of Soil and Water Conservation Needs* (U.S. Dept. Agr., SB-317, 1962) pp. 6-7.

Among the data collected in the 1977 NRI were estimates of potential cropland. SCS field staff visited each point and recorded the current land use. Each point not in cropland use was rated for its cropland potential. SCS made this rating by consulting with the local county extension agent, Agricultural Stabilization and Conservation Service county executive director, and local Farmers Home Administration county supervisor.

Each sample point not in crop use was classified as having either high, medium, low, or zero cropland potential. A sample point was classified as high potential land if, in the judgment of SCS and other USDA agency representatives, the economic feasibility of conversion was favorable, based on 1976 price-cost relationships, and if similar land had been converted to cropland in the county within the last 3 years. Zero potential land included desert, mountains, and land preempted for other uses. Low potential land included land with one or more serious obstacles to development. Medium potential land was the residual category having neither high potential for conversion nor serious development problems.

The 1977 NRI found 36 million acres of land with high potential for cropland and an additional 91 million acres of medium potential land.⁵ About 72 percent of the high and medium potential cropland was classified as pasture and range. Another 25 percent of potential cropland was classified as forest, with the remainder in other land uses.

The economic climate is an important determinant of the conversion potential of noncropland. Landowner decisions, however, determine whether potential cropland will actually be developed. Previous research has suggested that, even on high potential cropland, special characteristics relating to the ownership of the land could inhibit development.⁶ SCS and other personnel considered landownership status while assessing the conversion potential of noncropland, but this was an informal effort based on personal knowledge of the owner or operator. Data provided by the NRI/ESCS Landownership Survey merger allow a more detailed assessment of potential landownership obstacles based on information provided directly by the landowner.

A Landownership Profile of Potential Cropland

The NRI/ESCS Landownership Survey data enable us to examine landownership patterns on current cropland and compare these patterns to those that exist on high and medium potential cropland. If differences are found in these patterns—that is, differences in the landowners themselves—then development of potential cropland would involve decisions by landowners whose motives and responses to economic incentives may differ considerably from owners of current cropland. Ownership of potential cropland and cropland is not necessarily mutually exclusive. That is, the owner of a sample point classified as potential cropland may also own cropland elsewhere within the land unit on which the sample point fell. Conversely, the owner of a point of land classified as cropland may also own other land that would be classified as potential cropland had the sample point fallen there. Therefore, differences between owners of cropland and potential cropland, with respect to percentage distributions of the attributes considered in the following tables, should be taken as indications of tendency rather than absolute differences. (For interpretations of statistical reliability see the Appendix.)

This study found owners of potential cropland tend to have smaller holdings, lower net farm incomes, and less active involvement in agriculture compared to cropland owners. Only minor differences between the two types of owners were found in terms of such factors as age, education, and residence.⁷ Such patterns help identify the percentage of potential cropland affected by landownership problems.

Size of Landholdings

Potential cropland is more concentrated in both the smaller and the larger holdings categories than current cropland (table 1). About 20 percent of high potential and 21 percent of medium potential cropland is concentrated in holdings of less than 100 acres, compared to 13 percent of current cropland in these size categories. The greater proportion of potential cropland compared to cropland in the 10,000-acre category probably involves large range and forestland holdings.

Occupation

Approximately 48 percent of current cropland acreage is owned by farmers, but only 39 percent of high potential and 41 percent of medium potential cropland

⁵In 1975, based on more favorable 1974 price cost relationships, SCS reported 78 million acres of high potential land and 33 million acres of land with medium potential for cropland. See Diderksen, Hidlebaugh, and Schmude, *op. cit.*

⁶See Linda K. Lee, *A Perspective on Cropland Availability* (Econ. Stat. Coop. Serv., U.S. Dept. Agr., AER-406, 1978) p. 19.

⁷Linda K. Lee, Okla. State Univ., unpublished data.

is farmer owned (table 2). White collar and blue collar owners control a larger percentage of potential cropland than they do current cropland.

Net Farm Income

A larger percentage of potential cropland is held by low farm income landowners than is cropland (table 3). While 24 percent of cropland is owned by those with less than \$3,000 net farm income in 1978, 30 percent of high potential and 32 percent of medium potential cropland is owned by low-income landowners. Two caveats are necessary. Annual net farm income does not necessarily indicate longrun financial position. Also, income data were not obtained from corporations and estates. In addition, much potential cropland is controlled by owners—possibly not involved in agriculture—who report no farm income.

Table 1—Distribution of U.S. cropland and two classes of potential cropland among various sizes of total holdings of landowners

Size of holdings ¹	Cropland	High potential land	Medium potential land
<i>Acres</i>		<i>Percent</i>	
Less than 9	1.3	2.5	1.9
10-49	4.4	5.9	8.0
50-69	2.3	4.5	3.4
70-99	5.4	7.1	8.2
100-130	6.2	7.6	6.2
140-179	10.8	7.3	7.2
180-259	10.9	11.0	9.2
260-499	20.6	17.5	15.2
500-999	16.9	14.3	11.4
1,000-1,999	10.2	8.3	8.6
2,000-2,999	3.6	3.6	4.1
3,000-4,999	2.9	4.1	4.5
5,000-9,999	2.6	2.1	3.6
10,000 and greater	2.0	4.2	8.5
Total ²	100.0	100.0	100.0
<i>1,000 acres</i>			
Total acres	413,277	36,215	90,774

¹Holdings are reported on a county basis.

²May not total to 100 because of rounding.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

Table 2—Distribution of U.S. cropland and two classes of potential cropland among various occupations of landowners

Occupation	Cropland	High potential land	Medium potential land
		<i>Percent</i>	
White collar workers	10.3	13.5	12.3
Blue collar workers	5.7	9.0	9.6
Farmers ¹	48.2	39.3	41.0
Retired	17.4	17.4	15.5
Other	4.0	4.0	4.4
Corporations	7.5	8.3	9.5
No response	6.9	8.6	7.6
Total ²	100.0	100.0	100.0
<i>1,000 acres</i>			
Total acres	413,277	36,215	90,774

¹Includes farm laborers and managers.

²May not total to 100 because of rounding.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

Tenure Status

Tenure data in table 4 indicate, as do income data, that some potential cropland is owned by those not involved in agriculture. Approximately 12 percent of high and medium potential cropland acreage is owned by non-operator owners, those who do not operate any land for agricultural purposes and do not rent land to others for such purposes.⁸ Such owners may be holding pasture, range, and forestland for future nonfarm development, or they may be holding this land for hobby or recreation purposes. In either case, conversion to cropland is unlikely.

⁸The 3.7-percent of cropland acreage owned by nonoperator owners, those not involved in agriculture, appears to be contradictory. One explanation may be the timing of the surveys. SCS information on land use was obtained during the summer of 1977 while the ESCS Landownership Survey was sent out during 1978. Ownership of cropland in 1977 may have passed to nonoperator owners by 1978. Another explanation may be the difference between a visual assessment of land use by a field person versus an owner's assessment of land use activity.

Table 3—Distribution of U.S. cropland and two classes of potential cropland among various net farm income levels of landowners

Net farm income	Cropland	High potential land	Medium potential land
<i>Dollars</i>		<i>Percent</i>	
No farm income	6.6	11.7	14.1
10,000 or greater loss	4.1	3.4	4.8
3,000–9,999 loss	3.9	3.8	4.7
1–2,999 loss	4.3	6.3	6.8
0–2,999	12.1	16.2	16.2
3,000–6,999	11.5	9.0	9.1
7,000–9,999	6.9	4.6	4.1
10,000–14,999	6.6	5.9	4.3
15,000–19,999	4.4	3.4	2.0
20,000–24,999	3.7	2.2	1.3
25,000–49,999	4.8	3.1	2.5
50,000 and over	3.4	2.9	1.7
Corporations	7.5	8.3	9.5
No response	20.2	19.3	19.0
Total ¹	100.0	100.0	100.0
		<i>1,000 acres</i>	
Total acres	413,277	36,215	90,774

¹May not total to 100 because of rounding.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

Landowner Obstacles to Cropland Development

The differences between potential cropland owners and cropland owners have significant implications for cropland development. An owner's decision to convert non-cropland to cropland is presumably based on an analysis that finds total benefits of cropland development will exceed or at least equal expected development costs over a period of time. Within such a benefit-cost framework, certain economic and institutional factors might lead owners of land with similar physical potential to choose different discount rates and planning horizons. Different conclusions about cropland development will result.

Landownership factors affecting cropland development can be divided into four major categories: size of holdings, competition from other uses, planning horizons,

Table 4—Distribution of U.S. cropland and two classes of potential cropland among various tenure classifications of landowners

Tenure ¹	Cropland	High potential land	Medium potential land
		<i>Percent</i>	
Full-owner operator	24.5	26.7	29.5
Full-owner operator, landlord	6.5	7.6	6.7
Part-owner, operator	23.1	18.4	19.6
Part-owner, operator, landlord	2.7	2.5	2.5
Tenant, owner-operator	.7	.5	1.0
Nonoperator, landlord	31.1	19.7	18.9
Nonoperator owner ²	3.7	11.8	11.5
No response	7.7	12.9	10.3
Total ³	100.0	100.0	100.0
		<i>1,000 acres</i>	
Total acres	413,277	36,215	90,774

¹For complete definitions of these tenure categories, see Lewis, *op. cit.*, p. 6.²Those who do not operate any land for agricultural purposes and do not rent land to others for such purposes.³May not total to 100 because of rounding.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

and lack of capital. National estimates of high and medium potential cropland classified by these landownership factors were developed from the NRI/ESCS Landownership Survey data. The cumulative total in table 5—43.2 percent—represents the percentage of total potential cropland subject to at least one landownership obstacle to development. Cumulative totals for regions are presented in table 6.⁹

⁹States within each farm production region are: Northeast—Maine, N.H., Vt., Mass., R.I., Conn., N.Y., N.J., Pa., Del., Md.; Appalachia—Va., W. Va., N.C., Ky., Tenn.; Southeast—S.C., Ga., Fla., Ala.; Delta—Miss., Ark., La.; Corn Belt—Ohio, Ind., Ill., Iowa, Mo.; Lake—Mich., Wis., Minn.; Northern Plains—N. Dak., S. Dak., Nebr., Kans.; Southern Plains—Okla., Tex.; Mountain—Mont., Idaho, Wyo., Colo., N. Mex., Ariz., Utah, Nev.; Pacific—Wash., Oreg., Calif.

Size of Landholdings

Cropland development may be rejected if the operating unit is too small, because the necessary investments in machinery and technology cannot be repaid through agricultural profits. Even moderate-sized holdings can be affected if they are divided into fragmented parcels.

Table 5—U.S. potential cropland affected by one or more landownership obstacles

Obstacle	Potential cropland ¹ (high and medium)	
	Acreage affected by obstacle	Acreage unaffected by previous obstacles
	<i>Percent</i>	
Total holdings less than 50 acres	9.5	9.5
Average parcel size less than 25 acres	5.9	1.5
Nonoperator owner— SMSA county ²	3.3	1.7
Nonoperator owner— nonSMSA county	8.3	6.1
Hobby farmer	8.9	1.8
Located in SMSA with more than 250,000 population	9.3	5.7
Owner 75 or older (sole proprietor or husband- wife)	7.2	5.0
1978 net farm income less than 0	15.5	11.9
Total	NA	43.2

NA = Not applicable.

¹The percentage appearing in the left column represents all land which is affected by the obstacle appearing in the table stub. The percentage in the right column is the net acreage affected by a particular obstacle, or the acreage unaffected by all previous landownership factors. For example, 3.3 percent of the high and medium potential cropland is held by nonoperator owners in an SMSA county. However, 1.6 percent of that acreage is also affected by one or both of the above obstacles—"average parcel size less than 25 acres" and "total holdings less than 10 acres." The 1.7 percent in the right column thus represents the net amount of affected acreage added by the "nonoperator owner—SMSA" category. This method eliminates double counting of acreage which might have two or more obstacles to development. The total, 43.2 percent, represents the net acreage affected by one or more landownership factors.

²An SMSA (Standard Metropolitan Statistical Area) is a county or a contiguous group of counties of at least 50,000 people.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

To estimate the acreage of potential cropland involved in very small total holdings, 50 acres was considered a minimum size necessary for cropland development. The acreage reported by those owning less than 50 acres in the survey county represents, nationally, 9.5 percent of cropland. Small holdings are most prevalent in the Northeast, Appalachia, Delta, and Pacific regions.

As a measure of fragmentation of potential cropland in holdings greater than 50 acres, an owner's total holdings in the county of residence were divided by the number of units of land (tax parcels) these holdings represented. Holdings were classified as fragmented if the average parcel size was less than 25 acres.¹⁰ Almost 6 percent of high and medium potential U.S. cropland is contained in this category. Potential cropland in the Northeast and Pacific regions appears to be most affected by fragmented holdings.

Competition From Other Uses

Development for cropland is unlikely if noncropland can command a higher market price in urban or rural home uses than in agricultural use. This may mean that the returns that could be realized by converting potential cropland to crop use are outweighed by potential gains from future noncropland uses.

Owners of potential cropland may give priority to non-market goals such as recreation or hobby uses of their land. They may also plan to take advantage of pasture or forest ownership for a rural home. Cropland development may be less likely in such cases.

Approximately 3 percent of land with potential for cropland is estimated to be located in SMSAs (see footnote 2, table 5) and owned by nonoperators. Land in this category might be idle because of the landowner's anticipation of an urban use. Potential cropland most affected by this limitation is located in the Northeast and Pacific regions.

Eight percent of the high potential and medium potential cropland is controlled by nonoperator owners in rural areas or nonSMSA counties. Some of this acreage may be part of speculative holdings for rural homes or rural community expansion. Other acreage probably provides recreation or other nonmarket benefits for the landowner. In either case, the incentive to develop cropland due to changes in agricultural price-cost rela-

¹⁰Some tax parcels in a given holding may be adjacent or very unequal in size. As the survey data did not obtain information specific to tax parcels, these factors are not considered in the estimate of fragmented potential cropland holdings.

Table 6—U.S. potential cropland affected by one or more landownership obstacles, by region

Obstacle	Northeast	Lake	Corn Belt	Northern Plains	Appalachia	Southeast	Delta	Southern Plains	Mountain	Pacific
<i>Percent of acreage unaffected by previous obstacles¹</i>										
Total holdings less than 50 acres	18.0	9.8	7.1	0.9	15.0	11.1	16.4	9.3	1.2	21.7
Average parcel size less than 25 acres	6.3	2.7	1.8	.3	2.3	.5	1.5	0	.8	5.5
Nonoperator owner—SMSA county	7.0	.3	1.0	0	1.5	2.8	2.1	1.4	1.4	4.6
Nonoperator owner—nonSMSA county	11.9	8.7	3.6	.8	7.7	13.4	13.0	2.9	1.0	4.2
Hobby farmer	1.9	3.2	1.2	.7	2.1	3.5	3.0	1.7	.1	.6
Located in SMSA with more than 250,000 population	17.0	5.6	8.2	2.1	7.1	4.1	1.0	8.9	.4	8.1
Owner 75 or older (sole proprietor or husband-wife)	1.8	2.2	5.3	6.8	4.3	5.9	5.8	5.5	4.0	4.7
1978 net farm income less than 0	9.3	10.1	9.8	17.7	8.0	11.1	6.5	12.6	17.5	12.2
Total	73.2	42.6	38.0	29.3	48.0	52.4	49.3	42.3	26.4	61.6
<i>1,000 acres</i>										
Total potential cropland ²	4,637	8,121	14,362	17,878	14,349	15,782	9,967	20,020	14,143	5,470

¹See footnote 1 of table 5 for method of accounting.

²An additional 2.2 million acres of nonfarm land has high or medium potential for cropland for a total of 127 million acres nationally.

Source: 1977 National Resource Inventories (Soil Conserv. Serv., U.S. Dept. Agr.) and 1978 Landownership Survey (Econ. Stat. Coop. Serv., U.S. Dept. Agr.).

tionships may be rather weak. The Delta, Southeast, and Northeast regions contain the largest percentages of potential cropland in this category.

Another group for whom market incentives may be less important are hobby farmers. Almost 9 percent of the potential cropland acreage is held by owner-operators who use their land for agricultural purposes but did not report any farm income.

Planning Horizons

Cropland development decisions require evaluating costs and benefits over a given time period. The shorter the planning horizon, the more difficult it is to recoup development costs; the longer the planning horizon, the more likely it is that benefits will exceed costs. This section explores two of the factors that may affect planning horizons for cropland development decisions: age of the landowner and location of the land.

Older owners may not have as long a planning horizon as younger owners, particularly if control of the land is expected to pass to nonfamily members. As almost 60 percent of U.S. farmland was purchased by current owners from nonrelatives, much existing potential cropland will probably not be passed on to family members.¹¹ Consequently, many older landowners are not likely to be interested in cropland development.¹² Approximately 7 percent of potential cropland held in sole proprietor or husband-wife organizational arrangements is owned by those over 75 years of age. This does not include older landowners who work through partnerships or family corporations, and who presumably plan to pass land on to younger family members or associates who would continue agricultural operations.

Planning horizons for agricultural purposes will be shortened if the cropland is adjacent to urbanizing or developing areas.¹³ The impact of anticipated urbanization on cropland development can be expected to vary considerably with the type of agriculture present. Production of fruits and vegetables, for example, may be less affected by location near urban areas than such crops as wheat and soybeans since easy access to a market may be an advantage for producers of bulky,

perishable products. However, production of important export commodities like wheat and soybeans is competitive with urban land uses. Anticipated urbanization would hinder such cropland development decisions.¹⁴

The urban influence within SMSA counties is not uniformly strong. Some SMSA counties contain large rural areas only slightly affected by urban expansion, while other SMSA counties are predominantly urban. A better measure of urban influence might be commuting distances to an urban center, but such data are unavailable. To minimize this problem, only large SMSAs with more than 250,000 residents were used in this portion of the analysis.¹⁵ The NRI/Landownership Survey data indicate 9 percent of the potential cropland acres are located within SMSA counties of greater than 250,000 population. The region most affected by this factor is the Northeast.

Lack of Capital

Lack of access to capital could be a severe restriction to developing potential cropland, especially for lower income landowners having difficulty obtaining credit.¹⁶ Landowners with low incomes may also not be willing or able to forego current income for cropland development investments.

Net 1978 farm income data indicate that 15.5 percent of high and medium potential cropland was owned by those who reported net losses in 1978. An additional 16 percent was owned by those with a net farm income of less than \$3,000. This suggests that capital problems could inhibit the development of much potential cropland. The proportion of owners reporting net losses in 1978 was highest in the Northern Plains and the Mountain regions.

National and Regional Summary

At least 43 percent of the high and medium cropland acreage has one or more landownership obstacles to development. Approximately 20 percent of potential

¹¹Robert C. Otte, "Farm and Ranch Landownership in the United States, 1978," unpublished manuscript (Econ. Stat. Coop. Serv., U.S. Dept. Agr., 1980).

¹²This may be a short-term obstacle to cropland development. Potential cropland owned by older owners with no heirs will ultimately be a source of supply in the land market to owners who may find cropland developments attractive.

¹³The location of potential cropland is not a characteristic of the landowner, but it does influence the landowner's decision on potential cropland development.

¹⁴Production of wheat and soybeans declined in SMSA counties between 1959 and 1969, although production of other crops such as fruits, nuts, and vegetables increased. See Robert C. Otte, *Farming in the City's Shadow* (Econ. Res. Serv., U.S. Dept. Agr., AER-250, 1974) for a more complete analysis of agriculture in urbanizing areas.

¹⁵This categorization was suggested by the urban orientation classification system developed by Fred K. Hines, David L. Brown, and John M. Zimmer, *Social and Economic Characteristics of the Population in Metro and Nonmetro Counties, 1970* (Econ. Res. Serv., U.S. Dept. Agr., AER-272, 1975).

¹⁶The 1975 Potential Cropland Study indicated that only 35 of the 78 million acres of high potential land in the United States had no associated development problems, Lee, *op. cit.*, p. 8. This suggests that conversion of most potential cropland would entail costs.

cropland is subject to at least one major landownership obstacle to development—either small or fragmented holdings or competition from other uses. As much as an additional 23 percent of potential cropland may be subject to planning horizon and capital restrictions.

Most potential cropland in the Northeast and Pacific has landownership problems, while the Mountain region appears to have the fewest landownership obstacles to cropland development. Economic and physical factors have most encouraged recent cropland development in the Corn Belt and the Delta. In terms of remaining potential cropland acreage, the Corn Belt has fewer landownership problems than the Nation as a whole, but landownership obstacles are more prevalent in the Delta than they are nationally.

Conclusion

Farm policy in the United States looks to market forces to provide incentives for cropland conversion. Expectations about future commodity prices as well as conversion and production costs can, at some level, overcome many of the obstacles discussed in the previous section. However, some ownership problems are more responsive to market forces than others and still other problems, such as competition from urban uses, have evolved precisely because of the market. There obviously are limitations to the price mechanism's ability to bring all potential cropland into production.

The ability of the market system to consolidate small and fragmented holdings is influenced by the size and financial strength of adjoining cropland operations. Thus, potential cropland may be absorbed into larger operations far more easily in the Corn Belt than in the Appalachian region, although the economic outlook may be similar in both regions.

The expectation of very high farm profits may lead a landowner to choose conversion to cropland instead of recreation or hobby uses for the land. However, U.S. population pressures may force upward the value of rural land for recreation and open space activities. Agricultural uses may have difficulty competing with rural recreation land uses in more urbanized areas even at relatively high commodity prices.

Similarly, potential cropland in larger SMSAs may face increasing market pressure from urbanization. Urban pressure on rural land has been most noticeable in the

Northeast, where agricultural production has been on the decline. Population growth in the Sun Belt may create competition for potential cropland in more agriculturally oriented regions.

If favorable agricultural price-cost relationships are translated into higher land values, older owners of potential cropland may decide to sell earlier than planned, possibly advancing cropland development. A favorable outlook for agricultural commodities may also ease capital problems for some owners of potential cropland and encourage conversion of noncropland to cropland. Nevertheless, it would require time to transmit agricultural price changes into land values and improved capital positions and still more time for a landowner to react to these changes.

Public policies could intervene where market forces fail to induce cropland development decisions. Competition for potential cropland from urban or recreational uses could be limited through farmland preservation policies. Owners of potential cropland could be taxed to encourage cropland development. Public funds could be used for low-interest loans to finance conversions to cropland. There are costs associated with each of these policies, some economic but others involving a reduction in landowner property rights. Both types of costs would probably be incurred if all potential cropland were ever forced into production.

Even if some landownership problems on potential cropland may be overcome in the long run by market mechanisms or public policies, the shortrun problems created by these obstacles may be costly. Much potential cropland is subject to physical limitations, including susceptibility to erosion.¹⁷ If the quality of land immediately available for the cropland base is reduced through landownership obstacles, increased demands for agricultural products will intensify pressures on the remaining potential cropland with environmental problems. Increased soil erosion could be one consequence.

NRI/ESCS Landownership Survey data illustrate that landownership problems on potential cropland are significant in terms of the acreage affected and the costs associated with resolving these problems. Future evaluations of potential cropland should consider landownership impediments to cropland development in addition to the physical and economic dimensions of cropland availability.

¹⁷Lee, *op. cit.*, p. 9.

Appendix—Reliability of the Sample Data

Estimated coefficients of variation of selected national acreage estimates are provided in appendix table 1. These figures assume a random selection of data points although a stratified random sample was actually used in the SCS study.

The estimated sample error (SE) for each data category was calculated as follows:

$$SE = \sqrt{\frac{p(1-p)}{n}}$$

where SE = sample error

p = proportion of land use with a particular landownership characteristic

n = sample size

Estimated coefficient of variation, expressed in percentages, is equal to sample error divided by the estimated p multiplied by 100. The smaller the proportion of total land use a category represents, the larger the coefficient of variation becomes. In this report, regional estimates of potential cropland acreage affected by landownership obstacles (table 6) are less reliable than national estimates. Estimates of particular landownership obstacles within regions should be used with care.

Confidence statements concerning estimates may be obtained from the estimated standard errors or coefficients of variation. Appendix table 1 also presents the range within which it is possible to be 95 percent confident that the true estimate is contained.

Appendix table 1—Estimated accuracy of selected national data categories, 95-percent confidence level

1977 land use	Landownership classification	Proportion of total U.S. land area	Coefficient of variation <i>Percent</i>	Landownership category as a percentage of land use category	Confidence interval ¹
Cropland	Less than 50 acres	1.8	7.5	5.7	5.3–6.1
Potential cropland ²	Less than 50 acres	.9	10.7	9.5	8.5–10.5
Cropland	Farmers	15.2	2.4	48.2	47.3–49.1
Potential cropland	Farmers	3.8	5.0	40.5	38.9–42.1
Cropland	Nonoperator owners	1.2	9.2	3.7	3.4–4.0
Potential cropland	Nonoperator owners	1.1	9.6	11.8	10.8–12.8
Cropland	Less than \$3,000 net farm income	7.7	3.5	24.3	23.3–25.3
Potential cropland	Less than \$3,000 net farm income	3.0	5.5	32.2	30.6–33.8

¹Calculated with a ratio estimator. See William G. Cochran, *Sampling Techniques* (New York: John Wiley and Sons, 1977) p. 63.

²High and medium.

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